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May 5, 2006

Mr. Dwight E. Sanders
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Division of Environmental Planning and Management
100 Howe Avenue, Suite 100-South
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Re: State Clearinghouse Number 2004021107
Cabrillo Port Liquefied Natural Gas Deepwater Port Project
Revised Draft Environmental Impact Report Comments

I. Introduction

I have reviewed and prepared comments on the Cabrillo Port, Liquefied Natural Gas Deepwater Port Project, Revised Draft Environmental Impact Report (Revised DEIR), dated March 2006. In particular, I focused on the construction, operation, marine vessel, and Project-associated emissions of ozone precursor pollutants that will impact coastal California air quality.

The Revised DEIR fails to recognize a very simple premise: Ventura County and the South Coast Air Basin are nonattainment for ozone, and all Project NO_x and ROC emissions, whether offshore or onshore, will have a significant impact on this already unacceptable situation. Instead, the Revised DEIR tries to divide the Project operational and construction emissions among several impact classifications, thus taking a piecemeal approach to significance determinations and mitigation requirements. Predictably, this convoluted and unjustifiable methodology is not protective of onshore air quality impacts or the public health. P373-1

In addition, the Revised DEIR relies on several flawed assumptions that lead to underestimating Project operation and construction emissions. In these instances (discussed below), both the impacts and required mitigation are understated.

Summaries of my Revised DEIR comments are as follows: P373-2

- Emissions from all offshore sources will significantly impact onshore air quality, which is nonattainment for ozone (Comment III);
- The determination that Anacapa Island is in attainment for the Federal ozone standard is irrelevant, and based on flawed analyses of the existing data. The shaky interpretation of Anacapa ozone attainment status is the cornerstone for exempting the Project from binding and verifiable mitigation requirements (Comment IV);
- The Project construction emissions are likely underestimated due to optimistic schedules, equipment size, equipment rating, and equipment usage (Comment V);
- The Revised DEIR relies on incorrect Project FSRU emissions (Comment VI);
- The Revised DEIR does not evaluate or mitigate Project startup emissions, even though they are significant (Comment VII);

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The Project has been modified since issuance of the March 2006 Revised Draft EIR. See Section 1.4.2 for a summary of Project changes. The following Project changes would reduce emissions of nitrogen oxide and other air pollutants:
- Reduction in the number of LNG carriers and change in crew vessel trips;
- Use of natural gas to power LNG carriers in California Coastal Waters;
- Diesel-fueled support vessels with emission controls; and
- Use of specific engine standards for onshore construction equipment.

The Applicant has committed to implement the following additional measure to reduce air emissions:
- Repowering of existing non-Project vessels with cleaner-burning engines.

These changes required revisions to air pollutant emission estimates and related air quality analyses.

The significance criteria outlined in Ventura County Air Pollution Control District (VCAPCD) and South Coast Air Quality Management District (SCAQMD) CEQA assessment guidelines are used to establish the construction emission levels at which mitigation measures should be considered and/or an EIR/EIS should be prepared. These assessment guidelines do not stipulate that construction emissions need to be reduced to these levels or require emission offsets. Instead, the guidelines restate the CEQA requirement that all feasible mitigation measures must be applied to projects determined to have a significant impact as defined in the EIR/EIS.

Section 4.6.1.3 contains a revised summary of construction emissions. Section 4.6.4 contains a revised discussion of applicable mitigation measures. Section 4.6.4 contains revised information on Project impacts and mitigation measures. These revisions address the concurrent emission of ozone precursors from the FSRU and Project vessels.

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P373-4 through P373-26 respond to the comments summarized in this paragraph.

- The Revised DEIR fails to calculate Project LNG carrier emissions for California Coastal Waters (Comment VIII);
- The Revised DEIR identifies (but does not assess) the increased emissions caused by potentially higher heating value gas supplied by the Project (Comment IX);
- The Project operational and construction emissions are divided among three adjacent and different ozone attainment/nonattainment planning areas. The Revised DEIR never considers the sum total effects of all the Project emissions (Comment X);
- Onshore construction emissions result in Class I air impacts (Impact AIR-1), which are not mitigated to Class II by requiring offsets (Comment XI);
- Project FSRU and associated marine vessel emissions are incorrectly divided into two separate air impact findings (Impacts AIR-4 and AIR-5). These Project components must be considered together with the total emissions mitigated to insignificance (Comment XII);
- Project construction emissions in Federal waters significantly impact onshore nonattainment air quality and must be mitigated to insignificance (Comment XIII).

II. Qualifications

My comments on the Revised DEIR, presented below, are based on over 25 years of professional experience performing air quality and toxics exposure analyses. I was the senior air quality modeler and air toxics program coordinator for the Santa Barbara County Air Pollution Control District (SBAPCD), where I worked for approximately nine years. At the SBAPCD, I was also responsible for air quality modeling analyses used for determining the effectiveness of NO_x and ROC control measures on ozone formation, and the resultant process of attaining ozone standards as part of the Santa Barbara County's Air Quality Attainment Plan (AQAP). I also managed the EIR process for the District's AQAP, and I participated in several extensive meteorological analyses in the Santa Barbara Channel.

I am experienced in calculating emissions from offshore sources, including marine vessels. I have performed many air dispersion modeling analyses to determine the onshore impacts from these offshore emissions, and I reviewed and commented on beta-versions of the Minerals Management Service OCD model. As the first regulatory agency user of OCD, I developed detailed instructions for applying the model, as well as for OCDCPM, a hybrid version of OCD that was used in Santa Barbara County for permitting many offshore and coastal sources of air emissions.[1] I sited approximately 30 meteorological and air quality monitoring stations throughout Santa Barbara County, with many of them positioned specifically to track onshore impacts from offshore platform and marine vessel emissions. I also maintained a meteorological monitoring station on Platform Hondo, giving me a unique perspective on winds in the offshore environment.

While at the SBAPCD, I co-developed the mathematical, computer-based model for predicting community exposures to toxic air pollutants that was distributed by CAPCOA, the California Air Pollution Control Officers' Association. These measurements of exposure are often called Health

[1] Santa Barbara County Air Pollution Control District, Authority to Construct Permit Processing Manual, Section 6.0, Air Quality Impact Analysis, October 20, 1987.

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Thank you for the information.

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Risk Assessments. CAPCOA is a voluntary association of state and local government officials, largely engineers and scientists responsible for air pollution control in California. The computer model I co-developed (ACE2588) has been used by air districts throughout the state in evaluating AB 2588 submissions by facilities covered by the law, and used extensively by consultants who prepared AB 2588 submissions for the facilities. I provided technical support on using this model for over 10 years, until it was replaced with the California Air Resources Board (CARB) program, HARP. Recipients of this support included regulatory agencies, industrial sources, and consulting firms.

For the past 14 years I have been a private consultant, specializing in regulatory agency and litigation support. My clients include the California Attorney General's Office, the Los Angeles County District Attorney's Office, the California Office of Environmental Health Hazard Assessment, various air pollution control agencies, the California Air Pollution Control Officer's Association, and many private firms. I have prepared over 300 complete air toxics health risk assessments and over 1,000 air dispersion modeling analyses. I have successfully provided expert testimony in numerous Federal and State Court cases. My curriculum vitae is attached.

Following are my comments on the Revised DEIR.

III. Emissions from all Offshore Sources will Significantly Impact Onshore Air Quality, Which is Nonattainment for Ozone

Re: Section 4.6.1.2 Existing Air Quality

All Project offshore emissions will have an adverse impact on onshore air quality and must be meaningfully addressed in the Revised DEIR. Ozone is a regional pollutant – it is not restricted to the limited area in which it is emitted. The entire ozone regulatory framework is guided by this exceedingly clear principle. The effectiveness of control measures and emission reduction strategies are analyzed in regional, Eularian photochemical models; The requirements for project offsets are expanded to the entire county or air basin in question; Emission inventories are calculated for these same geographical impact areas.[2]

The Revised DEIR disregards the well-established knowledge that offshore emissions will come onshore, and that they contribute as much as onshore pollutant sources to the ozone nonattainment problem.

In essence, the Revised DEIR divides the offshore Project operational and construction emissions among several impact classifications, each with their own, non-overlapping requirements. The Revised DEIR does not consider the collective effects of the total Project emissions – in other words, the full impacts of ozone precursor emissions are ignored.

[2] Tesche, T.W. and McNally, D.E., May 1991. Photochemical Modeling of Two 1984 SCCCAMP Ozone Episodes. Journal of Applied Meteorology, 30,5,745-763.

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The Project has been modified since issuance of the March 2006 Revised Draft EIR. See Section 1.4.2 for a summary of Project changes. Section 4.1.8 contains a detailed description of the marine climatic setting. Section 4.6.1.2 has been revised to provide an expanded discussion of the potential transport of offshore air pollutant emissions to onshore areas due to meteorological conditions. Section 4.6.4 contains revised analyses of the impacts on air quality from the emissions of criteria pollutants, ozone precursors, and toxic air pollutants from the FSRU and Project vessels.

The air dispersion modeling analysis of the criteria air pollutant emissions from FSRU and Project vessel operational activities includes prediction of impacts at receptors located from the coastline to 2 miles inland spanning approximately 44 miles from Ventura to Malibu. Additional receptors were also placed along the coastline spanning approximately 38 miles from Malibu to the Palos Verdes Peninsula located directly south of Los Angeles.

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Section 4.6.4 contains updated information on impacts related to ozone precursor emissions. Impact AIR-4 contains information on emissions of ozone precursors from the FSRU; Impact AIR-5 contains information on emissions of ozone precursors from Project vessels operating in California Coastal Waters as defined by the California Air Resources Board; and Impact AIR-6 contains information on emissions of ozone precursors from Project construction activities in Federal waters. Together these three impacts address the full impacts of ozone precursor emissions.

There are many dozens of published and peer-reviewed accounts demonstrating that offshore emissions in the Project area are part of the onshore ozone nonattainment problem. Even 50 years ago, the *Southland Weather Handbook* presented wind streamlines showing that emissions from the Project location come directly onshore.[3] From this publication:

> The main onshore flow of sea air fans out from Santa Monica to below San Diego, reaching the coast from west-southwest in Santa Monica Bay and from the west-northwest in San Diego County. Islands and hills cause minor variations in the larger pattern, such as the deflecting influence of the Palos Verdes Hills. On the coast northwest of Santa Monica to Santa Barbara the sea air reaches the coast from a more southerly quarter.[4]

Many more sophisticated meteorological analyses have been prepared as part of ozone studies and SIP modeling applications for the South Coast and South Central Coast Air Basins. These analyses focus on the meteorological conditions and trajectories associated with elevated ozone concentrations; however, the general onshore flow patterns are also presented. A few examples of these studies include:

- Various early (1981 and previous) tracer gas releases from offshore and nearshore locations to track onshore impacts and land/sea air recirculation.[5,6] These tracer gas studies included an offshore release along the coast from Long Beach to Ventura. In all the studied tracer releases, the offshore emissions were found to be advected onshore.
- The South Central Coast Cooperative Aerometric Monitoring Program (SCCCAMP).[7,8] The SCCCAMP study was performed to develop modeling data for ozone attainment planning analyses in Santa Barbara and Ventura Counties. The mesoscale meteorological patterns observed during SCCCAMP demonstrate the strong onshore patterns in the Project area, as well as the land-sea breeze interaction. These wind flows couple the onshore and offshore areas such that they cannot be analyzed separately (as is being done in the Revised DEIR).
- The Southern California Air Quality Study (SCAQS).[9] This extensive study analyzed meteorological conditions, emissions, and pollutant formation (including ozone) from Ventura County through the South Coast Air Basin.

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[3] Aldrich, John H. and Myra Meadows. Southland Weather Handbook, 1956.
[4] Ibid, p.6.
[5] Shair, F.H., Application of Atmospheric Tracer Techniques to Determine the Transport and Dispersion Associated with the Land-Breeze Movement of Air Over the Los Angeles Coastal Zone, California Institute of Technology, prepared for CARB, December 2, 1982. The entire report can be downloaded from CARB at: http://www.arb.ca.gov/research/apr/past/atmospheric.htm.
[6] Shair, F.H., et al., Application Transport and Dispersion of Airborne Pollutants Associated with the Land Breeze-Sea Breeze System , October 1981.
[7] Hanna, Steven R., May 1991. Characteristics of Ozone Episodes during SCCCAMP. Journal of Applied Meteorology, 30,5,534-550.
[8] Douglas, Sharon G. and Kessler, Robert C., May 1991. Analysis of Mesoscale Air Patterns in the South-Central Coast Air Basin during the SCCCAMP 1985 Intensive Measurement Periods. Journal of Applied Meteorology, 30,5,607-631.
[9] Blumenthal, D.L., Watson, J.G., and Roberts, P.T. 1987. Southern California Air Quality Study (SCAQS) Program Plan, Sonoma Technology Inc. Report to the California Air Resources Board, June 1987.

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Section 4.1.8 contains a detailed description of the marine climatic setting for the proposed Project. Section 4.6.1.2 has been revised to provide an expanded discussion of the potential transport of offshore air pollutant emissions to onshore areas due to meteorological conditions.

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- The 1997 Southern California Ozone Study (SCOS97-NARSTRO).[10] The SCOS97 - NARSTO meteorological network collected data from June 16 through October 15, 1997. Emissions, meteorological, and air quality data were assessed for five different types of multi-day ozone episodes. The interrelated nature of offshore emissions and onshore air impacts is studied and documented.
- Air Quality Impacts from NO_x Emissions of Two Potential Marine Vessel Control Strategies in the South Coast Air Basin.[11] As part of SCOS97, tracer gases were released from two shipping lanes near the Project area – the current lane and a proposed lane farther from shore. The tracer gases were monitored onshore, and the results showed that both shipping lane releases impacted onshore air quality. Moving the emissions farther offshore did not always benefit onshore air quality, and in one test had a "disbenefit."[12]
- Analysis of Aerometric and Meteorological Data for the Ventura County Region.[13] This report describes the various trajectories that carry pollutants into Ventura County, including several emanating from offshore areas.
- The Structure and Variability of the Marine Atmosphere around the Santa Barbara Channel.[14] This paper studies the mesoscale meteorological conditions between Pt. Arguello and the Santa Monica Basin. The mean wind flow in the Santa Barbara Channel is shown to be strongly onshore, including the winds in the proposed Project area.

All of these studies, and many others, can be referenced to show that the emissions and air flow at the Project location contribute to the onshore ozone nonattainment problem. There is no meteorological or air quality basis for the Revised DEIR to exclude any Project emissions from emission reduction requirements. Every study points to the opposite conclusion, including the Revised DEIR itself.

Even BHP Billiton's meteorological data and air quality modeling, which are presented in the Revised DEIR, hurts, rather than helps, the argument for excluding any offshore emissions from mitigation requirements. The Revised DEIR includes modeling with the Offshore and Coastal Dispersion (OCD) model, which uses five years of meteorological data collected from one onshore (Oxnard Airport) and one offshore (Buoy Station 46025 – Santa Monica Basin) site (Revised DEIR, Appendix G7).[15] These data are for the years 2000 through 2004. While these meteorological data stations were not established with air dispersion modeling in mind (airports and ocean buoys do not generally collect high-quality meteorological data, and are not site-specific), the general wind flow

[10] Fujita, Eric M., et al., February 1999. SCOS97-NARSTRO 1997 Southern California Ozone Study and Aerosol Study, Volume III, Summary of Field Study. Desert Research Institute, prepared for CARB. 1998 AWMA papers available online at: http://www.arb.ca.gov/research/scos/awma_98/awma_98.htm; Publications available online at: http://www.arb.ca.gov/research/scos/scospub.htm.
[11] SCAQMD, and CARB, Air Quality Impacts from NO_x Emissions of Two Potential Marine Vessel Control Strategies in the South Coast Air Basin, Final Report, September 2000.
[12] Ibid., p. 44.
[13] Blumenthal, D.L., Smith T.B., Lehrman, D.E. et al., 1986. Analysis of Aerometric and Meteorological Data for the Ventura County Region, Sonoma Technology Inc. Report to the Western Oil and Gas Association, June 1986.
[14] Dorman, C.E. and Winant, C.D., February 2000. The Structure and Variability of the Marine Atmosphere around the Santa Barbara Channel. Monthly Weather Review, 128, 261-282.
[15] Sierra Research CEQA Air Quality Assessment.

patterns should be adequately characterized by these data. A frequency analysis of the wind speeds and direction (direction from which the wind is blowing) for the Santa Monica Basin Buoy data is presented in the following table.

Wind Frequency Distribution for: Santa Monica Basin Buoy (46025)

Period of meteorological data set data: 1/1/2000 - 12/31/2004

Wind Direction Sector (Degrees)	Downwind Area Impacted by this Wind Sector	% Non-Calm Hours	% from 0.1 – 3.0 m/s	% from 3 - 5 m/s	% from 5 - 10 m/s	% > 10 m/s	Average WS (m/s)
N: 348.75 - 11.25	Offshore	3.59	2.22	1.03	0.33	0.01	2.72
NNE: 11.25 - 33.75	San Nicolas Is.	2.55	1.64	0.55	0.30	0.05	2.87
NE: 33.75 - 56.25	Offshore	2.57	1.68	0.47	0.35	0.06	2.91
ENE: 56.25 - 78.75	Offshore	3.22	1.80	0.81	0.52	0.09	3.24
E: 78.75 - 101.25	SB Co. – Channel Is.	4.24	2.32	1.37	0.49	0.06	3.05
ESE: 101.25 - 123.75	SB Co.	4.47	2.47	1.37	0.53	0.10	3.17
SE: 123.75 - 146.25	Ven. Co. & SB Co.	4.54	2.65	1.37	0.46	0.07	2.98
SSE: 146.25 - 168.75	Ven. Co. – Ventura	3.80	2.58	0.89	0.30	0.02	2.57
S: 168.75 - 191.25	Ven. Co. – Pt. Mugu	3.49	2.52	0.68	0.26	0.03	2.49
SSW: 191.25 - 213.75	Ven. Co. – SE Coast	3.61	2.69	0.70	0.20	0.01	2.38
SW: 213.75 - 236.25	LA Co. – SW Coast	5.24	3.58	1.41	0.24	0.02	2.50
WSW: 236.25 - 258.75	LA Co. - Malibu	9.12	4.25	3.59	1.28	0.01	3.23
W: 258.75 - 281.25	LA Co. – Santa Monica	20.84	6.06	7.49	6.59	0.71	4.42
WNW: 281.25 - 303.75	LA Co. – Long Beach	12.15	4.04	4.14	3.05	0.93	4.55
NW: 303.75 - 326.25	LA Co. - Catalina	10.00	3.80	3.53	2.56	0.12	3.86
NNW: 326.25 - 348.75	Offshore	6.04	2.93	2.15	0.95	0.01	3.24
	Totals:	99.45	47.20	31.54	18.41	2.30	

Total number of hours in meteorological data set: 43,848
Number of calm hours: 242 (wind speeds less than 0.1 m/s)
Period Ave. Wind Speed: 3.53 m/s
Calm hours are not included in average wind speeds.

Wind directions from each of the 16 cardinal compass points are shown in the above table, along with the percentage of winds that emanate from each of the 22.5 degree sectors centered on that direction. The frequency of winds, by wind speed category and for all hours, is listed for each of these sectors. Also shown is the representative downwind area impacted by the winds from each sector.

The predominant winds measured at the Santa Monica Basin Buoy are from the west/southwest to northwest, which directly impact Los Angeles County. This table shows that roughly 57 percent of the Santa Monica Basin Buoy winds blow ashore in Los Angeles County. Winds blow towards Ventura County about 15 percent of the time, and to Santa Barbara County with somewhat less than 10 percent frequency. Offshore winds (not blowing directly towards California) are measured about

18 percent of the time. In essence, emissions from the Project area will blow onshore roughly 80 percent of the time.

This finding is consistent with CARB's analysis of offshore emissions and the potential for these emissions to affect onshore air quality. CARB analyzed the prevailing wind direction, by month, at a number of coastal sites in central and southern California. For stations near the proposed Project, the prevailing wind direction (direction with the highest percent of frequency) blows onshore every month of the year at Santa Barbara, 11 months of the year in Oxnard, nine months of the year at Pt. Mugu Naval Air Station, and 11 months of the year at Santa Monica.[16] These results are supported by tracer studies, modeling exercises, and other analyses considered by CARB.

The modeling impacts from offshore Project sources (using the Santa Monica Basin Buoy data) are shown graphically in Figures 1-1 through 1-16 of the Revised DEIR, Air Quality Appendix G7. Each of these figures show that the proposed Project and marine vessels will increase onshore air concentrations of criteria air pollutants in Ventura and Los Angeles County, including the ozone precursor, NO_2. This is a direct product of the prevailing winds on the Project area, which transport the offshore emissions onto onshore areas.

BHP Billiton, however, does not present any photochemical modeling for ozone formation potential. Rather, the air quality assessment (Revised DEIR Appendix G7, Section 2.1.2) attempts to use the Gaussian OCD modeling approach to support the conclusion that "the unique attributes of the proposed Project demonstrate that there is insignificant potential for the proposed Project to impact the onshore ozone nonattainment area." BHP Billiton does not provide any documentation, peer-reviewed, published, or otherwise, to support their unique method of characterizing ozone impacts from Gaussian dispersion modeling – a method that does not consider photochemical reactions and other parameters necessary to assess ozone impacts. Ozone formation from NO_x and ROC emissions is not linear -- BHP Billiton has not shown in any meaningful way that onshore ozone impacts caused by Project emissions will be insignificant.

Contrary to the conclusions of Air Quality Appendix G7 (BHP Billiton's "Air Quality Assessment"), the Revised DEIR correctly determines that Project NO_x emissions will significantly impact onshore ozone concentrations (Impacts AIR-4 and AIR-5). It appears that the Revised DEIR did not rely on Air Quality Appendix G7 in reaching these significance determinations.

The offshore Project emissions will greatly exceed the Ventura County Air Pollution Control District (VCAPCD) and the South Coast Air Quality Management District (SCAQMD) significance thresholds (see Comment XII below). By this standard alone, the offshore Project emissions will be significant. And although the Project emissions are being released offshore, as explained above, this does not counter the likelihood for causing significant onshore ozone impacts. In addition, for a source with greater NO_x emissions (relative to ROC), the highest ozone contribution often occurs at

[16] California Air Resources Board, Staff Report: Initial Statement of Reasons for Proposed Rulemaking. Proposed Regulation for Auxiliary Diesel-Electric Engines Operated on Ocean-Going Vessels Within California Waters and 24 Nautical Miles of the California Baseline. October 2005. Appendix F: Offshore Emissions Impacts on Onshore Air Quality.

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Section 4.6.4 contains information on an air quality analysis of criteria air pollutant emissions from Project operations. This analysis was performed using the offshore coastal and dispersion (OCD) model and to assess potential ambient air impacts of criteria pollutants, excluding ozone. Potential ambient concentrations of NO_2 predicted by the OCD model were not used to assess potential ozone impacts.

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Section 4.6.4 contains a comparison of Project offshore emissions that occur in Ventura County waters to significance criteria outlined in Ventura County Air Quality Assessment Guidelines. No offshore emissions would occur in Los Angeles County waters as a result of the Project. Since the USEPA has proposed to issue an Authority to Construct under Ventura County Air Pollution Control District (VCAPCD) Rule 10, Ventura County significance criteria are not applicable to Cabrillo Port equipment or operations. Emissions from Project vessels (i.e., LNG carriers, tugs, service vessels) operating in Federal waters are not subject to regulation under the Deepwater Port Act, and therefore, the significance criteria or emissions offsets established for Ventura County or Los Angeles County are not applicable.

However, Impact AIR-4 and Impact AIR-5 in Section 4.6.4 have been revised to provide specific information regarding the Applicant's emissions reduction programs and their review by the USEPA and the California Air Resources Board (CARB). As part of air permit-to-construct application procedures, the Applicant has committed to the USEPA to achieve emissions reductions (in addition to reductions inherent to the Project) to an amount equal to the FSRU's annual NOx emissions. The Applicant has executed contracts to retrofit two marine vessels (long haul tugs) by replacing the propulsion engines of each vessel with modern low emitting engines (Tier 2 compliant diesel-fired engines). At the request of the USEPA and the CARB, the Applicant conducted source testing to assist in determining the emission reductions expected as a result of the retrofits. Both the USEPA and the CARB have reviewed the results, but there is not yet a consensus on the estimated emission reductions from the mitigation proposal.

Based on the USEPA's and CARB's estimates, the proposed Emissions Reduction Program (AM AIR-4a) would provide for NOx emission reductions greater than the estimated annual NOx

emissions from FSRU equipment and estimated NOx emissions from operation of LNG carrier offloading equipment. However, the total emission reductions would be less than the annual NOx emissions estimated for all operations (FSRU and Project vessels) in California Coastal Waters, as defined by the CARB. According to CARB, the emission reduction proposal "represents more than what would otherwise be required by the current determination of applicable regulations."

Appendix G9 contains a memorandum from the CARB to the CSLC on this topic. Electronic copies of the Applicant's reports submitted to the USEPA that detail the tug retrofits and related emission reductions are available at www.epa.gov/region09/liq-natl-gas/cabrillo-air.html.

greater downwind distances, compared to culpable ozone levels in the near-field areas. In other words, distance alone does not mitigate Ventura and Los Angeles County ozone impacts caused by the Project offshore NO_x emissions.

And sometimes the simplest observation is the most telling: The BHP Billiton methodology for assessing the significance of potential ozone impacts is never used in regulatory ozone attainment analyses. Nonattainment area modeling is complex, and requires detailed studies of three-dimensional meteorological parameters, initial and boundary conditions, photochemistry, regional emission inventories, and other inputs.[17] If the VCAPCD and the SCAQMD applied the flawed BHP Billiton reasoning to their ozone planning and permitting process (which they do not), no source would be culpable for contributing to the ozone nonattainment problem, and no progress at attaining (or at least maintaining) clean air standards would be possible.

Regulatory agencies have long recognized the need to address, reduce, and mitigate (offset) NO_x emissions from offshore sources, including marine vessels. CARB specifically developed a definition of California Coastal Waters for this purpose, described as "the area offshore of California within which pollutants are likely to be transported ashore and affect air quality in California's coastal air basins, particularly during the summer."[18] The SCAQMD, with CARB, prepared analyses of potential emission control strategies for marine vessels off of Southern California – the goal being to reduce onshore ozone impacts from these offshore emissions.[19] And the Santa Barbara County APCD has stated the problem very clearly: "Marine shipping, the largest unregulated source of oxides of nitrogen (NO_x) emissions, remains a significant long-term obstacle to achieving ozone standards in coastal areas, as documented in the example of Santa Barbara County in California.[20] The Revised DEIR, by separating offshore activities into several impact classifications, is attempting to circumvent the obvious need to treat all Project emissions equally. All Project ozone precursor emissions, offshore or onshore, operation or construction, will significantly impact onshore ozone concentrations and must be mitigated to insignificance.

IV. The Determination that Anacapa Island is in Attainment for the Federal Ozone Standard is Irrelevant, and Based on Flawed Analyses of the Existing Data

Re: Section 4.6.1.2 Existing Air Quality

Table 4.6-2 of the Revised DEIR shows the Federal air quality area designations for Ventura and Los Angeles counties. For Ventura County, there are two areas for designation: the mainland portion, and the Channel Islands, which include Anacapa and San Nicolas islands. Table 4.6-2 shows that the Channel Islands are in Federal attainment status for all criteria pollutants, except SO_2, which is

[17] Tesche, T.W. and McNally, D.E., May 1991. Photochemical Modeling of Two 1984 SCCCAMP Ozone Episodes. Journal of Applied Meteorology, 30,5,745-763.
[18] California Air Resources Board, Report to the California Legislature on Air Emissions from Marine Vessels, Volume I, June 1984, p.78.
[19] SCAQMD, and CARB, Air Quality Impacts from NO_x Emissions of Two Potential Marine Vessel Control Strategies in the South Coast Air Basin, Final Report, September 2000.
[20] Murphy, T.M., Santa Barbara County APCD, The Need to Reduce Marine Shipping Emissions – A Santa Barbara County Case Study, AWMA paper, 2003.

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P373-9

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Section 4.6.4 contains information on an air quality analysis of criteria air pollutant emissions from Project operations. This analysis was performed using the offshore coastal and dispersion (OCD) model and to assess potential ambient air impacts of criteria pollutants, excluding ozone. Potential ambient concentrations of NO_2 predicted by the OCD model were not used to assess potential ozone impacts.

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The Project has been modified since issuance of the March 2006 Revised Draft EIR. AM AIR-4a contains information on an emissions reduction program to retrofit two marine vessels; AM AIR-5a describes the use of natural gas and ultra low sulfur diesel on LNG carriers; and AM AIR-5b contains information on the use of ultra low sulfur diesel and pollution control equipment on support vessels.

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Sections 4.6.1.3 and 4.6.2 contain revised information on the air quality designations for the Channel Islands that are within the boundaries of Ventura County (Anacapa and San Nicolas Islands). The determination of the air quality designations of the Channel Islands, including those in Ventura County, with respect to National Ambient Air Quality Standards, is under the jurisdiction of the USEPA.

unclassified due to lack of data. Table 4.6-2, however, is incorrect. The Federal designation for the Channel Islands portion of Ventura County is unclassifiable/attainment for all pollutants, including the one-hour and eight-hour ozone standards.[21]

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The history behind the Federal ozone attainment status for Anacapa Island is murky at best. From 1991 through 1994, the VCAPCD used the EPA designation that all of Ventura County is nonattainment for ozone.[22] This was based on the November 6, 1991 Federal Register, page 56731, which listed all of Ventura County as the Ventura County nonattainment area. To confuse the matter, on the next page (56732) the Federal register designated the South Central Coast (remainder of), Channel Islands, as unclassifiable/attainment, even though Anacapa and San Nicolas Islands are part of Ventura County.[23] On December 5, 1996, at the request from the US Navy, the EPA wrote to the VCAPCD that Anacapa and San Nicolas Islands are not part of the Ventura County nonattainment area.[24] This letter also references that the VCAPCD Board specifically exempted San Nicolas Island from the AQMP requirements, pending a formal determination from EPA.

That Mainland Ventura County should be nonattainment for ozone and that San Nicolas Island (which is over 50 miles further offshore than Anacapa, and has no historical air quality data) should be attainment/unclassified seems clear. Caught in the middle of this uncertainty, however, is Anacapa Island. Anacapa is relatively near to the mainland – the closest of the Channel Islands, at about 14 miles from shore. Anacapa also has multiple years of air quality data, including ozone measurements.

Hourly ozone readings were collected on Anacapa Island from 1985 through 1992. The percent of data coverage, however, was less than desirable. For example, in 1989 and 1990, only four and two percent coverage during typical periods of high concentration were achieved, respectively. The best year for data collection was 1992, with 82 percent coverage during typical periods of high concentration. The average collection efficiency over the years 1985 through 1992 was only 48.5 percent.[25] The air quality monitoring effort at Anacapa Island ended in 1992.

Despite the short duration monitoring program and the relatively low number of hours of ozone data actually collected, Anacapa Island experienced a number of concentrations exceeding the State and Federal ozone standards. In 1988, 1991, and 1992 (the last three years with any meaningful data), there were six, three, and four days, respectively, exceeding the State one-hour ozone standard of 0.09 $\mu g/m^3$. These three years also had four, three, and three days, respectively, exceeding the Federal eight-hour ozone standard of 0.08 $\mu g/m^3$. The actual number of days exceeding ozone standards would have been significantly higher if the air pollution regulatory agencies (EPA, CARB, and VCAPCD) rounded up based on the third significant figure, rather than down. Thus, in regulatory algebra, an eight-hour average ozone concentration of 0.084 $\mu g/m^3$ does not exceed the

[21] 40CFR 81.305.
[22] Letter from Richard Baldwin, VCAPCD, to David P. Howekamp, EPA Region IX, December 1, 1994.
[23] Ibid.
[24] Letter from David P. Howekamp, EPA Region IX to Richard Baldwin, VCAPCD, December 5, 1996.
[25] CARB Air Quality Data CD Vol. 1.

NAAQS of 0.08 $\mu g/m^3$. While this makes it easier for the regulatory agencies to demonstrate attainment, it is not a health-protective practice in any sense whatsoever.

An even easier method to "demonstrate" attainment is to just stop measuring any and all air quality data in a particular area. This is apparently what happened on Anacapa Island when the ozone monitoring station was removed, even though ozone concentrations exceeding State and Federal standards were measured on October 13, 1992 – only 18 days before the last data were collected. In a somewhat confusing set of correspondence between the VCAPCD, EPA, and the US Navy, the Federal ozone status for Anacapa became "attainment," despite contradictory existing ozone measurements, the relatively short distance to the rest of the Ventura County nonattainment area, and the CARB designation for Anacapa as nonattainment for State ozone standards.

Emissions from the Project FSRU, marine vessels, and construction activities will impact onshore ozone nonattainment areas in Ventura and Los Angeles counties. CEQA requires the State Lands Commission (SLC) to mitigate to insignificance all Project associated emissions – this has not been done in the Revised DEIR. As discussed in Comment III above, offshore NO_x and ROC emissions are transported onshore, where they undergo photochemical reactions to form ozone. In fact, for a source with greater NO_x emissions (relative to ROC), the highest ozone contribution often occurs at greater downwind distances, compared to culpable ozone levels in the near-field areas. This is because time is needed for these photochemical reactions to occur, and with time the pollutants are advected downstream (and onshore) with the prevailing wind fields. This was demonstrated many times by the Santa Barbara County Air Pollution Control District in their Lagrangian photochemical modeling analyses of potential onshore ozone impacts from offshore oil development NO_x and ROC emissions.[26]

From a geographical standpoint, the proposed Project is 21.4 miles from Anacapa Island, but only 13.8 miles from the nearest mainland landfall (Revised DEIR, Figure 2.1-2).[27] Yet, the proposed Project is accepted by the Revised DEIR to be in the same air quality designation area as Anacapa Island. Interestingly, the closest mainland point to the FSRU is only about 0.4 miles west of the Los Angeles/Ventura County line.[28] Based on distance alone, the Project should be considered part of the onshore nonattainment areas, and not the unclassified/attainment designation for Anacapa Island.

There is no question – the Revised DEIR is assisting the applicant in cherry-picking the Federal ozone attainment status that best suits its purpose. Of the three possible options – serious nonattainment within the SCAQMD, moderate nonattainment within the onshore portions of the VCAPCD, or a loophole-filled attainment status for Anacapa Island, the Revised DEIR sides with the least restrictive and most distant set of requirements. The Revised DEIR, however, must address and mitigate all potential significant Projects, regardless of whether a particular agency has proposed an exemption. The FSRU and associated marine vessel emissions will significantly contribute to

[26] For example, such modeling was prepared for the Exxon Santa Ynez Unit FEIS/R.
[27] 12.01 NM = 13.8 miles; 18.61 NM = 21.4 miles.
[28] Ibid. The analogy of placing a casino on the left side of a jurisdictional boundary, while gambling is illegal on the right side, is inescapable.

P373-11 Continued

P373-11 Continued

P373-12

P373-13

P373-14

P373-12
The Project has been modified since issuance of the March 2006 Revised Draft EIR. See Section 1.4.2 for a summary of Project changes. Section 4.6.1.3 contains revised information on Project emissions and proposed control measures. Section 4.6.4 discusses the health effects attributed to air pollutants and includes revised impacts and mitigation measures.

P373-13
The USEPA has made a preliminary determination, on which the lead agencies must rely, that the FSRU should be permitted in the same manner as sources on the Channel Islands that are part of Ventura County. Section 4.6.2 contains an updated discussion of relevant regulatory requirements.

P373-14
See the responses to Comments P373-13 and P373-12, respectively.

ambient ozone impacts in the areas located downwind of the Project, which if unmitigated, is a CEQA Class I impact.

From an air quality standpoint, there is no basis for attaching the proposed Project to the Federal ozone attainment designation for Anacapa Island. The issue at hand is whether the proposed Project will have a significant onshore air quality impact (it will) and how can this impact be mitigated (offsets of NO_x and ROC). The Revised DEIR must mitigate emissions to the maximum extent feasible, including verifiable offsets for all Project and Project-associated emissions. The favorable regulatory and permitting requirements identified in the Revised DEIR are not valid, and will only interfere with the VCAPCD and SCAQMD progress towards attaining and maintaining ambient air quality standards.

The Revised DEIR should specify that offsets, consistent with VCAPCD and SCAQMD NSR Rules, be required to mitigate the Project Class I impacts.

V. Emissions from Construction Activities are Optimistic and Unverifiable

Re: Section 4.6.1.3 Regulated Air Pollutant Emissions – Construction Activities

The Revised DEIR presents calculated emissions for each of the various construction phases. These emissions are presented (in tons for each activity) in the table below (from Revised DEIR, Table 4.6-11).

Construction Activity	Total Emissions (tons)					
	NO_X	SO_2	CO	PM_{10}	$PM_{2.5}$	ROC
Federal Waters						
Mooring/FSRU Installation	27.4	0.02	33.8	1.6	1.6	4.0
Offshore Pipeline Installation	82.4	0.06	101.5	4.8	4.8	11.9
Subtotal	**109.8**	**0.08**	**135.3**	**6.4**	**6.4**	**15.9**
Ventura County						
Offshore Pipeline Installation	14.5	0.010	17.9	0.8	0.8	2.1
Shore Crossing Construction	37.8	0.027	46.4	3.5	2.5	5.5
Onshore Pipeline Installation - Trenching	16.5	0.017	24.8	1.9	1.4	2.6
Onshore Pipeline Installation - Pipelay	11.5	0.066	57.0	8.0	2.6	3.0
Onshore Pipeline Installation - Boring	5.5	0.004	6.7	1.0	0.5	0.8
Worker Commuting	0.54	0.067	7.9	0.14	0.14	0.25
Subtotal	**86.4**	**0.19**	**160.7**	**15.3**	**8.0**	**14.1**
Los Angeles County						
Onshore Pipeline Installation - Trenching	8.3	0.0084	12.4	0.94	0.71	1.3
Onshore Pipeline Installation - Pipelay	5.8	0.033	28.5	4.0	1.3	1.5
Onshore Pipeline Installation - Drilling	13.0	0.0092	15.9	1.4	0.93	1.9
Worker Commuting	0.41	0.0514	6.1	0.11	0.11	0.19
Subtotal	**27.4**	**0.10**	**62.9**	**6.5**	**3.0**	**4.8**
TOTAL	**224**	**0.37**	**359**	**28**	**17**	**35**

There are many equipment, activity, and scheduling assumptions in the Revised DEIR that could underestimate construction NO_x emissions, including:

P373-14 Continued

P373-14 Continued

P373-15

P373-15
The emissions analyses are derived from and consistent with historic operation and construction schedules of comparable projects and thereby incorporate typical deviations from normal conditions.

- A slight delay in Project schedule;
- Interferences with the Project schedule due to migrating marine mammals;
- An underestimation of the time required to complete each phase;
- An underestimation of the number of equipment needed to perform any task;
- An underestimation of the equipment size and horsepower to perform any task;
- An underestimation of the equipment load needed for the construction activities.

Based on my experience in calculating and modeling construction emissions, the Revised DEIR is relying on an optimistic schedule and emission inventory – for offshore as well as onshore (both Ventura and Los Angeles County) activities. For example, the entire onshore pipeline installation process allocates 180 activity days for trenching a distance of over 22 miles (combined Los Angeles and Ventura County onshore pipeline segments). The Revised DEIR does not provide any comparative studies or examples to support that this implementation schedule is realistic. All assumptions used are undocumented. Also, potentially lengthy delays from pipeline crossings at difficult points, such as Highways 1 and 101 in Ventura County are not discussed. Neither are problems that could be encountered with high water tables, which are likely to be found in southern Ventura County. Delays or underestimated activity days translate into additional construction emissions not accounted for in the Revised DEIR.

While it is helpful to identify what the expected emissions will be from construction, the Revised DEIR does not specify any enforceable emission-limiting conditions for these activities. We are asked to believe that construction scheduling, equipment size and number, and percent of operating power (load) will be as presented in the Revised DEIR.

Since it is nearly impossible to forecast the final and true construction schedule, the Revised DEIR must adopt mitigation requirements that limit the total emissions (in tons or tons per quarter) for each of the activities presented in Table 4.6-11. The only identified mitigation measure for these construction emissions, MM AIR-1a, fails to incorporate this necessary condition. Without this backstop, the applicant could continue to emit construction emissions well beyond those presented in the Revised DEIR with no regulatory consequences or meaningful mitigation requirements. I am providing additional input on the Revised DEIR-proposed construction mitigation measures and impact classifications (based on lbs/day emission thresholds) in Comments XI and XIII, below.

VI. The Revised DEIR Relies on Incorrect FSRU Emission Calculations

Re: Section 4.6.1.3 Regulated Air Pollutant Emissions – Stationary Operations

The emissions from the DF50 Wartsila main generator engines at the FSRU are based on an inappropriate emission factor. The Revised DEIR calculates NO_x emissions for these units using a NO_x emission concentration of 9 ppmv (gas mode).[29] This NO_x emission concentration is from Wartsila data, which is based on operating at 90 percent load.

[29] BHP Billiton, Minor New Source Review Construction Permit Application, Cabrillo Port, December 2005. Appendix E: FSRU Equipment Vendor Specifications; Wartsila Specification number 00470507-S504.

P373-15 Continued

P373-15
Continued

P373-16

The USEPA Region 9 issued a draft Proposed Authority to Construct (i.e., draft air permit-to-construct) for the Cabrillo Port FSRU. Condition V.A.1 of the draft air permit-to-construct contains specific emission limits on air pollutant concentrations in exhaust from the Wartsila Generators (with control equipment) and Submerged Combustion Vaporizers (SCVs). These limits do not vary with equipment load. Thus, the effective limits on allowable air pollutant mass rates (in terms of pounds per hour) would decrease with lower equipment loads. Condition VI.B of the draft air permit-to-construct contains specific stack testing and/or continuous emission monitoring requirements for air pollutant emissions from the Wartsila Generators (with control equipment) and SCVs.

P373-16

NO_x emission concentrations are not constant – they change as the engine load increases or decreases. The engine manufacturer, Wartsila, has emphasized this important point in many of its vendor specification sheets, including the DF50 engines proposed for use by BHP Billiton. For example, Wartsila footnotes their DF50 emission concentrations with the following warning: "Values at 90% load, not valid at other loads!"[30] The exclamation point is from Wartsila.

I attempted to obtain the Wartsila DF50 engine NO_x emission factors for loads other than 90 percent. I contacted Wartsila directly (on March 30, 2006), and asked for emission factors at other load levels, but I have not yet received a response.

This is very important, yet missing, information. While the emission factor is applicable to 90 percent loads, the main generator engines at the FSRU operate at an average load factor of only 51.2 percent (Revised DEIR, Appendix G2).[31] BHP Billiton, however, applied the NO_x emission concentration for 90 percent loads – even though there is no evidence that it is any way applicable to the conditions at the FSRU. BHP Billiton must recalculate their Wartsila DF50 main generator engine NO_x emissions using data for loads of about 50 percent, and not the inappropriate 90 percent levels that they applied in the Revised DEIR. Since NO_x concentration usually increases as the load level decreases, the Project NO_x emissions are likely to be underestimated.

VII. The Revised DEIR Failed to Disclose Air Impacts from the Project LNG Carriers

Re: Section 4.6.1.3 Regulated Air Pollutant Emissions – Stationary Operations

The Revised DEIR assumes that LNG carriers making deliveries to the FSRU will have 60,000 horsepower engines. These engines are stated to run on 99% gasified LNG and 1% diesel fuel (by weight) as a pilot fuel (Revised DEIR, p. 4.6-15). The Revised DEIR, however, has not identified any LNG carriers that will be able to run on the combined gasified LNG and diesel fuels. Since BHP Billiton is assuming 130 berths per year at the FSRU, a significant number of these tankers will be needed. For the Revised DEIR to be credible, the fleet of dual-fueled LNG carriers must to be verified. In other words, the Revised DEIR has not demonstrated that such LNG carriers are available for the Project.

It is disconcerting that the Revised DEIR does not address any specifics regarding the proposed LNG carriers. Obviously, these tankers need to exist before the Project can proceed as described in the Revised DEIR. Also, had the tanker fleet been identified, specific engine sizes and pollutant information could be applied to the Project emission calculations. The Revised DEIR fails to provide specific information for either of these Project components.

Instead, the Revised DEIR calculates pollutant emissions for the LNG carriers using off-the-shelf USEPA emission factors. In this case, an emission factor is used to calculate the amount of air pollutants emitted by burning a given amount of fuel. For example, the Revised DEIR LNG carrier

[30] Ibid.
[31] 110903 MW-hr/(24.75 MW*8760 hr) = 51.2%.

P373-16 Continued

P373-16 Continued

P373-17

P373-17
Section 4.6.1.3 contains updated information on the LNG carrier engine configurations and associated emissions. A combination of purpose-built vessels (those constructed exclusively for the Project) and other vessels not dedicated to the Project would deliver LNG to the FSRU. Contracts with vessel operators would require all LNG carriers to be powered exclusively by Wartsila 50DF series dual-fuel electric engines or equivalent dual-fuel electric engines. The LNG vessels would be equipped with an array of dual-fuel electric engines of varying sizes to provide power for propulsion as well as auxiliary systems on the vessel. The vessels would not be fitted with auxiliary boilers or generators.

P373-17 Continued

P373-17
Continued

emission factor for NO_x is 0.847 lb per million BTU of gas burned. Because the heat content of the gas can be estimated, the emission factor can also be presented in units of grams of emissions per brake horse-power hour (g/bhp-hr). The Revised DEIR made this unit conversion, and, for example, the NO_x emission factor for the LNG carriers is 2.794 g/bhp-hr.

The emission factors for the Revised DEIR LNG carrier were obtained from the USEPA document for emission calculations, known as AP-42. Specifically, the Revised DEIR applied emission factors from the section for four-stroke lean-burn natural gas-fired engines, such as those used for gas compressors.[32] This raises an obvious question: Why didn't the Revised DEIR apply emission factors for actual gasified LNG-fueled tanker engines that are proposed for the Project? If such LNG carriers exist in numbers sufficient to serve the 130 berthing visits to the FSRU, then surely they can be tested to develop engine-specific emission factors.

The Revised DEIR simply used inappropriate emission factors for calculating air emissions from the LNG carriers. The AP-42 four-stroke lean-burn natural gas-fired engine emission factors are derived from tests performed on stationary onshore engines, not LNG carriers or marine vessels of any kind. The AP-42 emission factors that were used in the Revised DEIR for calculating LNG carrier emissions apply to relatively small gas compressor engines, not extremely large tanker propulsion units.

Specifically, the AP-42 four-stroke lean-burn natural gas-fired engine emission factors are derived from 13 tests performed on gas compressor engines:

- 3 tests of engines at 736 hp;
- 6 tests of engines at 1100 hp;
- 1 test of an engine at 2000 hp;
- 2 tests of engines at 4200 hp;
- And 1 test of an unrated hp engine.

The average rating of the AP-42 tested compressor engines was about 1,600 horsepower. These engines are not representative of large marine vessel engines, and average only about 2.7 percent of the Project LNG carrier horsepower rating (60,000 hp). The AP-42 emission factors (and those used in the Revised DEIR) are in no way applicable to LNG carriers. The vast difference in engine type, size, and the intended applications (tankering vs. gas compressors) stretches the intended use of these factors beyond any reasonable limit. Further, the AP-42 four-stroke lean-burn natural gas-fired engine emission factors are derived from tests performed using natural gas, not a mix of 99% gasified LNG and 1% diesel fuel as proposed for the Project.

In no uncertain terms, the LNG carrier emissions are based on incorrect and inapplicable emission factors which make the Revised DEIR unreliable. This same concern applies to the Project tug emissions, which also use these inapplicable emission factors. The Revised DEIR should employ

[32] USEPA, AP-42, Section 3.2, Natural Gas-Fired Reciprocating Engines, 7/00, Table 3.2-2.

P373-17 Continued

emission rates obtained from source-tests or vendor specifications for the engines being proposed, rather than applying emission factors for a completely different class of engines.

In addition to using the wrong pollutant emission factors, the inventory of LNG carrier emissions is incomplete. The Revised DEIR did not include any generator or auxiliary boiler emissions from the LNG carriers, even though these are typical components of such marine vessels, regardless of the mode of operation (e.g., cruising, maneuvering, or hoteling).[33] Given that the Revised DEIR has not required the use of marine vessels that can operate without such auxiliary engines (i.e., diesel-electric propulsion), the potential emissions and the resultant onshore air quality impacts from LNG carriers are certainly underestimated.

The Revised DEIR also fails to include LNG carrier emissions from transit in California Coastal Waters. The Revised DEIR calculates emissions only within 25 nautical miles (NM) of shore, which substantially underestimates the Project emissions that will adversely affect onshore air quality. The extent to which the Project LNG carrier NO_x emissions are underestimated is presented in the following discussion and calculations.

The Revised DEIR developed an activity scenario for each LNG carrier berthing at the FSRU. Each berth was assumed to include LNG carrier activities within 25 NM of shore, and would last for 24 hours. For example, the LNG carrier was assumed to travel at 12 knots for 45 minutes (nine NM) while in the area from 16 to 25 NM from shore. And while in this mode, the LNG carrier engine was assumed to be operating at 47.5 percent load. The assumptions for this mode and the other activities used in calculating the LNG carrier emissions are presented in the following table:

Cabrillo Port LNG Carrier NO_x Emissions: Revised DEIR Calculations

Berthing Activity	Miles	Speed (mph)	Time (hrs)	Percent Engine Load	Net BHP	Activity BHP-Hr	NO_x Emissions Each Berth (lb)	Annual NO_x Emissions (tons)
75 to 25 miles	--	--	--	--	--	--	--	--
25 to 16 miles	9.0	12	0.75	47.5%	28500	21375	131.7	8.56
16 to 13 miles	3.0	5	0.60	19.0%	11400	6840	42.1	2.74
Safety Zone	0.3	1	0.30	9.1%	5440	1632	10.1	0.65
Unload	0.0	stop	20.70	9.1%	5440	112608	693.6	45.09
Safety Zone	0.3	1	0.30	9.1%	5440	1632	10.1	0.65
13 to 16 miles	3.0	5	0.60	19.0%	11400	6840	42.1	2.74
16 to 25 miles	9.0	12	0.75	47.5%	28500	21375	131.7	8.56
25 to 75 miles	--	--	--	--	--	--	--	--
Totals:			**24.0**				**1061.3**	**69.0**

[33] SCAQMD, and CARB, Air Quality Impacts from NO_x Emissions of Two Potential Marine Vessel Control Strategies in the South Coast Air Basin, Final Report, September 2000, p.21. See also: California Air Resources Board, Staff Report: Initial Statement of Reasons for Proposed Rulemaking. Proposed Regulation for Auxiliary Diesel-Electric Engines Operated on Ocean-Going Vessels Within California Waters and 24 Nautical Miles of the California Baseline. October 2005, pp. III-5 – III-8.

P373-17 Continued

P373-18

The area of California Coastal Waters in which emissions would be mitigated was determined in conjunction with the California Air Resources Board (Simeroth 2005) as discussed in Impact AIR-5 in Section 4.6 of the March 2006 Revised Draft EIR.

However, as previously stated, the Project has been modified since issuance of the March 2006 Revised Draft EIR. See Section 1.4.2 for a summary of Project changes. LNG carriers associated with the Project would operate on natural gas (boil-off gas from the LNG cargo) with 1 percent diesel pilot during all operations in California Coastal Waters. Section 4.6.1.3 contains revised information on emissions and proposed control measures from LNG carriers operating in California Coastal Waters, as defined by the California Air Resources Board. The emission summaries in this section incorporate all emissions expected to occur in California Coastal Waters.

P373-18 Continued

P373-18
Continued

Using these assumptions, the Revised DEIR calculates about 69 tons/year NO_x emissions from the 130 LNG carrier berths anticipated annually.[34] Besides the application of an inappropriate emission factor, other questionable assumptions are used for the LNG carriers. The engine load factors, a key component in the emission calculations, have not been documented in the Revised DEIR – they are simply BHP Billiton estimates. Such documentation is essential and should have been included in the Revised DEIR.

A key omission in the LNG carrier emission calculations is the Project contribution in the California Coastal Waters beyond 25 NM from shore. In the Project area, the CARB-defined California Coastal Waters extend to about 90 miles from the coast.[35] To be conservative, and because the point where the LNG carriers will enter California Coastal Waters is uncertain, I limited my analysis of emissions from to 75 NM from the mainland shore.

Beyond 25 NM from shore, marine vessels are in cruise mode, with a typical speed of about 15 knots.[36] In this mode, the engines run at about 80 percent load.[37] Using the same NO_x emission factor as the Revised DEIR (even though it is not appropriate), results in LNG carrier NO_x emissions within California Coastal Waters totaling 197.1 tons/year. This is an increase of about 128 tons/year NO_x over that identified in the Revised DEIR. These emission calculations are presented in the following table:

Cabrillo Port LNG Carrier NO_x Emissions: Revised DEIR Calculations, LNG Boil-Off Gas Used in CA Coastal Waters Beyond 25 NM

Berthing Activity	Miles	Speed (kt)	Time (hrs)	Percent Engine Load	Net BHP	Activity BHP-Hr	NO_x Emissions Each Berth (lb)	Annual NO_x Emissions (tons)
75 to 25 miles	50.0	15	3.33	80.0%	48000	160000	985.6	64.06
25 to 16 miles	9.0	12	0.75	47.5%	28500	21375	131.7	8.56
16 to 13 miles	3.0	5	0.60	19.0%	11400	6840	42.1	2.74
Safety Zone	0.3	1	0.30	9.1%	5440	1632	10.1	0.65
Unload	0.0	stop	20.70	9.1%	5440	112608	693.6	45.09
Safety Zone	0.3	1	0.30	9.1%	5440	1632	10.1	0.65
13 to 16 miles	3.0	5	0.60	19.0%	11400	6840	42.1	2.74
16 to 25 miles	9.0	12	0.75	47.5%	28500	21375	131.7	8.56
25 to 75 miles	50.0	15	3.33	80.0%	48000	160000	985.6	64.06
Totals:			**30.7**				**3032.5**	**197.1**

[34] The Revised DEIR calculates 69.2 tons/year NO_x; the slight difference is due to rounding of load factors in the emission calculations.
[35] California Air Resources Board, Staff Report: Initial Statement of Reasons for Proposed Rulemaking. Proposed Regulation for Auxiliary Diesel-Electric Engines Operated on Ocean-Going Vessels Within California Waters and 24 Nautical Miles of the California Baseline. October 2005. Appendix F: Offshore Emissions Impacts on Onshore Air Quality, p. F-3.
[36] SCAQMD, and CARB, Air Quality Impacts from NO_x Emissions of Two Potential Marine Vessel Control Strategies in the South Coast Air Basin, Final Report, September 2000, p. 19.
[37] Ibid, p. 21.

P373-18
Continued

The above emissions, however, are based on the Project LNG carriers using gasified LNG in all areas within California Coastal Waters. This is not what BHP Billiton is proposing to do. Apparently, BHP Billiton intends to switch back and forth between diesel and gasified LNG as the carriers cross the boundary at 25 NM from shore. In other words, BHP Billiton is only committing to use gasified LNG for carrier activities within 25 NM from shore: "LNG carriers, tugboats, and the crew/supply boat would operate only with natural gas as the primary fuel while operating in State waters and Federal waters within 25 NM (29 miles or 46 km) of the coastline. (Revised DEIR, p. 4.6-16). Also, "By maintaining a specified amount of LNG in the LNG carrier cargo tanks after transfer operations, the LNG carrier would be able to operate on boil-off gas until it is beyond 25 NM (29 mile or 46 km) of the coast of California (Revised DEIR, pp. 4.6-15 - 4.6-16).

The NO_x emissions from the LNG carrier will increase substantially when it is operating on diesel fuel. If, for example, the LNG carriers were to use fuel oil in California Coastal Waters beyond 25 NM from shore, the annual NO_x emissions from LNG transfers would increase to 507 tons/year. This is an increase of about 438 tons/year NO_x that were not addressed or identified in the Revised DEIR. Since BHP Billiton has made no commitment to use boil-off gas for the full transit across California Coastal Waters, the Revised DEIR must recalculate the LNG carrier NO_x emissions using diesel fuel for travel beyond 25 NM from shore.

The LNG carrier emission calculations from using diesel fuel in California Coastal Waters beyond 25 NM from shore are presented in the following table. The NO_x emission factor for diesel fuel at 80 percent engine load is 9.553 g/bhp-hr, which is over three times greater than the value used in the Revised DEIR (2.794 g/bhp-hr).[38]

Cabrillo Port LNG Carrier NO_x Emissions: Revised DEIR Calculations, Diesel Fuel Used in CA Coastal Waters Beyond 25 NM

Berthing Activity	Miles	Speed (kt)	Time (hrs)	Percent Engine Load	Net BHP	Activity BHP-Hr	NO_x Emissions Each Berth (lb)	Annual NO_x Emissions (tons)
75 to 25 miles	50.0	15	3.33	80.0%	48000	160000	3369.6	219.02
25 to 16 miles	9.0	12	0.75	47.5%	28500	21375	131.7	8.56
16 to 13 miles	3.0	5	0.60	19.0%	11400	6840	42.1	2.74
Safety Zone	0.3	1	0.30	9.1%	5440	1632	10.1	0.65
Unload	0.0	stop	20.70	9.1%	5440	112608	693.6	45.09
Safety Zone	0.3	1	0.30	9.1%	5440	1632	10.1	0.65
13 to 16 miles	3.0	5	0.60	19.0%	11400	6840	42.1	2.74
16 to 25 miles	9.0	12	0.75	47.5%	28500	21375	131.7	8.56
25 to 75 miles	50.0	15	3.33	80.0%	48000	160000	3369.6	219.02
Totals:			**30.7**				**7800.5**	**507.0**

[38] Ibid, p. 20. CARB presents the diesel-fuel NO_x emission factor at 80% load as 12.81 g/kW-hr, which converts to 9.553 g/bhp-hr.

VIII. The Revised DEIR does not mitigate Project startup emissions

Re: Section 4.6.1.3 Regulated Air Pollutant Emissions – FSRU Start-Up Activities

The Revised DEIR calculates that there will be 42.3 tons/year of NO_x emissions from Project startup activities, and that these emissions would occur over about 60 days (Revised DEIR, pp. 4.6-16, 4.6-17). The startup emissions, however, are not addressed as contributing to any air impact, and no mitigation measures are identified in the Revised DEIR.

On a 24-hour basis, the Project startup emissions equal about 1,410 pounds of NO_x per day – a level that exceeds the daily emissions from the entire Project when in full operation (see Comment XII).[39] These emission rates can be compared to significance criteria for operational activities for both the VCAPCD and the SCAQMD. The significance threshold for operational NO_x emissions in the VCAPCD is 25 lbs/day (Revised DEIR, Table 4.6-16). The Project startup emissions exceed this significance threshold by a factor of 56.4. The significance threshold for operational NO_x emissions in the SCAQMD is 55 lbs/day.[40] The Project startup emissions exceed this significance threshold by a factor of 25.6. Clearly, the Project startup emissions should have been identified as contributing to significant impacts, and which will require mitigation to the maximum extent feasible.

The Revised DEIR, however, does not consider any mitigation at all for Project startup emissions. As discussed in Comments XI and XIII below, the Revised DEIR must require offsets to mitigate construction emissions that will significantly impact onshore air quality. If construction impacts were mitigated with emission reductions, the Revised DEIR could also require the construction offsets to remain in effect until startup is complete. This would ensure that no net emission increases would occur that will interfere with the progress towards attaining the NAAQS for ozone.

P373-19

IX. Project Emissions from Higher BTU Gas were not Included

Re: Section 4.6.2 Regulatory Setting

The Revised DEIR briefly addresses the issue of increased regional NO_x emissions that could be caused by higher BTU gas supplied through the proposed LNG terminal (Revised DEIR, p. 4.6-24). This "hotter" gas results from higher concentrations of C2-C4 hydrocarbons (ethane, propane, and butane) in the natural gas itself (which is mainly comprised of methane). Higher BTU gas results in increased combustion temperatures, and therefore potentially greater NO_x emissions, as compared to gas meeting current CARB specifications for compressed natural gas as motor vehicle fuel.[41] Increased NO_x emissions could result from stationary, mobile, and area source use of this potentially higher BTU gas.

P373-20

[39] 42.3 tons/60 days * 2000 lbs/ton = 1,410 lbs/day.
[40] SCAQMD Air Quality Significance Thresholds, Rev. January 2006.
[41] Letter from Tom Murphy, Santa Barbara County APCD to Lt. Ken Kusano, U.S. Coast Guard and Mr. Cy Oggins, California State Lands Commission, February 25, 2005.

P373-19
Section 4.6.4 provides a revised discussion and analysis of the air quality impacts associated with FSRU start-up emissions. FSRU start-up emissions are distinguished from normal FSRU operational emissions because start-up emissions are a one-time occurrence and distinguished from construction emissions because the emissions are associated with operational activities.

P373-20
As indicated in Section 4.6.2, the natural gas imported by the proposed Project would need to meet the requirements of Rule 30 and General Order 58-A of the California Public Utilities Commission (CPUC) or it could not be accepted for distribution by SoCalGas. Rule 30, as described, has specific requirements, including a heating value range.

Section 4.6.2 contains additional information on the regulatory setting affecting air quality and a revised discussion of the heating value of imported natural gas that incorporates the recent rulemaking by the CPUC. An analysis of the impacts of the CPUC rulemaking is beyond the scope of this document as required by NEPA and the CEQA.

The SCAQMD also addresses the increased emissions resulting from combusting higher heating value gas. As presented in the Revised DEIR, such use in stationary source non-residential natural gas-fired equipment could increase NO_x emissions by over 20 percent (Revised DEIR, p. 4.6-24). By not addressing this concern, the veracity of the Revised DEIR is in question. This is a potentially major source of NO_x emissions that have not been incorporated into the area ozone nonattainment plans for areas that would receive the Cabrillo Port gas. If there are no conditions limiting the BTU content of the gas to be delivered by BHP Billiton, then the Revised DEIR must analyze the significant impacts that will likely occur from the area-wide use of higher heating value gas. This is particularly important should higher heating value gas from locations other than Scarborough Field (such as Indonesia) be delivered through Cabrillo Port (Revised DEIR, p. 2-15). The Revised DEIR must identify all possible locations where Project gas could be obtained, then calculate the resultant area-wide emissions and impacts caused by distributing and using the gas from each source field, and require appropriate emission offsets.

P373-20 Continued

X. Emissions from the FSRU, Associated Marine Vessels, and Offshore/Onshore Construction Will Adversely Impact Onshore Air Quality

Re: Section 4.6.4 Impact Analysis and Mitigation

The Revised DEIR addresses emissions and impacts of ozone precursor emissions (NO_x and ROC) from the Project sources. The construction emissions onshore and in State waters are discussed in Impact AIR-I; since no offsets are identified (and none are offered by BHP Billiton for Ventura County), these emissions are listed as significant Class I impacts. The FSRU emissions are discussed in Impact AIR-4, and are found to be mitigatable Class II impacts. The Marine Vessel Emissions in California Coastal Waters are presented in Impact AIR-5, and are listed as Class I impacts, because BHP Billiton has not yet resolved how they will offset these Project emissions.[42] And the offshore construction emissions in Federal waters are discussed in Impact AIR-6; these are listed as insignificant Class III impacts not requiring mitigation at all.

P373-21

All of the Project offshore emissions must be subject to the same mitigation requirements – all of these emissions will impact the onshore nonattainment areas for ozone. The Revised DEIR is inherently flawed in that it divides the Project emissions into several categories, even though from an air impact standpoint they are inseparable. Most notably, there is no reason at all to disconnect the ozone precursor emissions from the FSRU apart from the associated Project marine vessel emissions. By dividing the emissions among several impact classifications, the Revised DEIR is piecemealing the mitigation requirements, and is undermining the need to offset all offshore Project emissions. Separating the offshore emissions into three impact groups ignores the many thoroughly-documented meteorological analyses verifying that all offshore emissions will come onshore and impact mainland air quality.

P373-22

Ventura County and Los Angeles County are nonattainment for Federal and State ozone standards. The primary regulatory tool for achieving reasonable further progress towards attaining the NAAQS

P373-23

[42] The Revised DEIR has not considered all marine vessel emissions in California Coastal Waters; they only addressed emissions within 25 NM of shore.

P373-21
The Project has been modified since issuance of the March 2006 Revised Draft EIR. See Section 1.4.2 for a summary of Project changes. Section 4.6.1.3 contains revised information on Project emissions and proposed control measures.

P373-22
Section 4.6.4 contains information related to the impacts associated with all offshore emissions from the Project.

P373-23
Ventura County Air Pollution Control District (VCAPCD) Rule 26.2 and South Coast Air Quality Management District (SCAQMD) New Source Review Regulation XIII are applicable only to stationary source emissions. Further, the USEPA has made a preliminary determination that the emission offsets requirements outlined in VCAPCD Rule 26.2 are not applicable to Cabrillo Port equipment and operations.

P373-23 Continued

P373-23
Continued

for ozone is to require the project applicant to obtain "offsets" of the project emissions. For example, for sources that have the potential to emit 25 tons or more per year of NO_x or VOC, VCAPCD Rule 26 requires offsets at a ratio of 1.3:1, and the offsets must meet specific requirements specified in this Rule.[43] Similarly, SCAQMD New Source Review Regulation XIII requires offset ratios of 1.0:1 to 1.2:1 for emissions of any nonattainment air contaminant.[44]

The Revised DEIR calculates 231.3 tons/year of project NO_x emissions from the FSRU and marine vessels (Revised DEIR, Appendix G2). Accordingly, VCAPCD Rule 26 would require over 300 tons/year of regulatory-approved NO_x offsets, after applying the 1.3:1 offset ratio (multiplier). This approach is necessary to make reasonable further progress towards attaining the ozone NAAQS in Ventura County. If impacts are not mitigated consistent with VCAPCD Rule 26, just the opposite effect would occur: attainment of the ozone NAAQS would be delayed, or perhaps made impossible, and the public health impacts from breathing such air would be extended. In Southern California, with over 30 years of experience in ozone transport analysis, photochemical modeling, and control measure experience, an exemption for a source of 231.3 tons/year NO_x emissions would be unthinkable.

In Table 4.6-15, the Revised DEIR reports: "Based on an analysis of the Deepwater Port Act and VCAPCD rules, the USEPA concluded that Rule 26 does not apply to the FSRU and that emission offsets are not required for Project sources constructed in the area where the FSRU is proposed to be sited." (Revised DEIR, p.4.6-21.) This is a very significant shortcoming in the environmental analysis, one which may exempt all of the Project operational emissions from any meaningful and binding offsets under the Clean Air Act. The SLC, however, cannot rely on such exemptions under CEQA. Significant air quality impacts must be mitigated to the maximum extent feasible.

The "reasoning" behind the Project exemption for offsets lies in the USEPA determination that the Project is located in an attainment area for ozone (Anacapa Island), and therefore is not subject to VCAPCD Rule 26. This finding ignores three key facts:

- The offshore emissions from the Project will negatively impact onshore air quality and must be mitigated (see Comment III above);
- The attainment status determination for Anacapa Island is completely without merit;
- The Project is much closer to the onshore portions of the VCAPCD and the SCAQMD.

To compound this error even further, the Revised DEIR uses a similarly flawed logic for finding that Project construction emissions in Federal waters will be insignificant (see Comment XIII below). Dividing the single-owner Project emissions into several jurisdictional regions, each with its own separate and unequal significance threshold, defeats the main purpose of the Revised DEIR: To ensure that significant environmental impacts are properly considered and mitigated.

[43] VCAPCD Rule 26.2.
[44] SCAQMD Rule 1303 (b)(2).

XI. The Revised DEIR Does Not Adequately Mitigate Construction Emissions in Either the VCAPCD or SCAQMD

Re: Section 4.6.4 Impact Analysis and Mitigation

Identified as Impact AIR-1, the Revised DEIR finds that "Project construction activities in Ventura and Los Angeles Counties would generate emissions that exceed quantitative thresholds for ozone precursors NO_x and ROCs, and CO." (Revised DEIR, p. 4.6-25). The calculated Project construction emissions and the corresponding VCAPCD and SCAQMD significance thresholds are presented in the following tables (from Revised DEIR, p. 4.6-26):

	Daily Emissions (pounds/day)			Quarterly Emissions (tons/quarter)		
Ventura County	**CO**	**NO_x**	**ROCs**	**CO**	**NO_x**	**ROCs**
Offshore Pipeline Installation	n/a	5,726	830	n/a	n/a	n/a
Shore Crossing Construction	n/a	1,323	191	n/a	n/a	n/a
Worker Commuting	n/a	7	4	n/a	n/a	n/a
Subtotal	n/a	7,056	1,025	n/a	n/a	n/a
Onshore Pipeline Installation						
Trenching	n/a	276	43	n/a	n/a	n/a
Pipelaying	n/a	237	60	n/a	n/a	n/a
Boring	n/a	368	53	n/a	n/a	n/a
Worker Commuting	n/a	4	2	n/a	n/a	n/a
Subtotal	n/a	885	158	n/a	n/a	n/a
VCAPCD Threshold for Mitigation	**n/a**	**25**	**25**	**n/a**	**n/a**	**n/a**

Los Angeles County	**CO**	**NO_x**	**ROCs**	**CO**	**NO_x**	**ROCs**
Onshore Pipeline Installation						
Trenching	413	276	43	6.2	4.1	0.65
Pipelaying	1,123	237	60	14.3	2.9	0.75
HDD	1,060	865	125	7.9	6.5	0.95
Worker Commuting	51	4	2	3.1	0.2	0.1
Subtotal	2,647	1,382	230	31.5	13.7	2.5
SCAQMD Significance Threshold	**550**	**100**	**75**	**24.75**	**2.5**	**2.5**

The Revised DEIR identifies that "Pursuant to the General Conformity Rule, the Applicant proposes to fully offset annual NO_x emissions generated from construction activities in Los Angeles County." (Revised DEIR, p. 4.6-27). The DEIR is correct in noting that the annual offsets for construction emissions in Los Angeles County (27.4 tons/year NO_x) are not anticipated to decrease the daily emissions to less than the SCAQMD significance criterion of 100 pounds/day. The Revised DEIR identifies this as a Class I air impact, which will require a statement of overriding consideration from the SLC, or the Project could not go forward.

It is difficult to imagine, though, what the basis could be for a statement of overriding consideration. In the case of Ventura County, the Revised DEIR doesn't even have the Draft Conformity Determination to offer as a rationale for mitigation, as this document (incorrectly) finds that the construction emissions in Ventura County conform to the ozone nonattainment SIP and won't require offsets. And BHP Billiton isn't offering any construction offsets in Ventura County, either

P373-24

P373-24
The Project has been modified since issuance of the March 2006 Revised Draft EIR. See Section 1.4.2 for a summary of Project changes. Section 4.6.1.3 contains revised information on Project emissions and proposed control measures.

In March 2006, the USCG and MARAD solicited public input on a Draft General Conformity Determination, which concluded that NOx emissions generated from Project construction activities in Los Angeles County were subject to the General Conformity Rule. All other Project-related emissions were determined not to be subject to the General Conformity Rule. Subsequent to the issuance of the Conformity Determination, BHPB provided a written commitment that all onshore pipeline construction equipment would, to the extent possible, utilize engines compliant with USEPA Tier 2, 3, or 4 non-road engine standards with Tier 2 being the minimum standard for any engine.

Project emissions were then reanalyzed to assess the potential emission reductions associated with the stated commitment and to reassess the applicability of the General Conformity Rule. The revised General Conformity analysis concluded that all applicable Project emissions would be less than de minimis thresholds in both Ventura and Los Angeles Counties and, therefore, not subject to the General Conformity Rule. Based on this conclusion, the USCG and MARAD will not finalize the Draft General Conformity Determination.

Section 4.6.1.3 and Section 4.6.2 contain revised Project emission estimates and a revised discussion of the applicability of the General Conformity Rule to the Project, respectively. Appendix G4 contains a copy of the revised General Conformity analysis.

Section 4.6.4 discusses the health effects attributed to air pollutants and includes revised impacts and mitigation measures.

on an annual or a daily basis. Given this second layer of nonexistent mitigation, the decision maker has no justification for issuing a statement of overriding consideration for this significant air impact.

The Revised DEIR offers MM AIR-1a as a mitigation measure for limiting net emission increases of construction emissions in State waters and onshore Ventura and Los Angeles Counties (Revised DEIR, p. 4.6-27). This mitigation measure includes a condition that "the Applicant shall prepare a Construction Emissions Reduction Plan and work with the VCAPCD and SCAQMD to implement specific measures contained in the plan." This plan should also contain a construction emissions and activity tracking system, so that it can be verified that the Project emissions do not exceed the levels identified in the Revised DEIR. Of course, this Construction Emissions Reduction Plan and the other requirements of MM AIR-1a are meaningless until the Applicant has offset their emissions liability to levels below the VCAPCD and SCAQMD significance thresholds.

XII. The FSRU and Associated Marine Vessel Emissions Are Incorrectly Divided into two Separate Air Impact Findings

Re: Section 4.6.4 Impact Analysis and Mitigation

The Revised DEIR calculates that 231.3 tons/year of NO_x emissions will be emitted by the FSRU and associated marine vessels (Revised DEIR, Appendix G2). For purposes of impact consideration and mitigation, however, the Revised DEIR divides these Project emissions into two separate categories. There is no explanation or justification provided for this piecemeal approach, other than BHP Billiton's undocumented offer to provide emission reductions for only the FSRU NO_x emissions.

The FSRU emissions are discussed in Impact AIR-4, and are listed as Class II impacts. The Revised DEIR notes in Applicant mitigation measure AM AIR-4a that BHP Billiton has committed to provide emission reductions "by an amount up to the FSRU's annual NO_x emissions." (Revised DEIR, p. 4.6-33). The Marine Vessel Emissions in California Coastal Waters are presented in Impact AIR-5, and are listed as Class I impacts, because BHP Billiton has not yet resolved how they will offset these Project emissions.[45]

There is no air quality basis for separating the FSRU from the marine vessel emissions – these are all part of the same pool of Project emissions that will significantly affect onshore air quality. Because of the inseparable nature of these air releases, the Revised DEIR must consider the combined total Project emissions in establishing mitigation requirements.

In the first place, the total Project operational NO_x and ROC emissions should have been subject to the verifiable and binding offsets required in VCAPCD Rule 26. The USEPA has given a favorable recommendation (for the applicant) that sidesteps this obvious and straight-forward approach, mainly by attaching the Project to a flawed attainment determination for Anacapa Island. This results in the watered-down consideration of Applicant-identified emission reductions, rather than the stricter

[45] The Revised DEIR has not considered all marine vessel emissions in California Coastal Waters; they only addressed emissions within 25 NM of shore.

P373-24 Continued

P373-24
Continued

P373-25

P373-25
Section 4.6.4 contains information related to the impacts associated with all offshore emissions from the Project.

See the response to Comment P373-11.

offset requirements of VCAPCD Rule 26. To make matters worse, the Revised DEIR continues to tangle this web by then dividing the Project into two separate components, each with its own impact consideration and emission reduction mitigation.

Rather than the convoluted and piecemeal approach to considering and mitigating emissions, the Revised DEIR must subject the entire Project emissions to an offset program consistent with VCAPCD Rule 26. This would require over 300 tons/year of regulatory-approved NO_x offsets (after applying the 1.3:1 offset ratio), and is the only reasonable approach to mitigating Project NO_x emissions to insignificance.

On a 24-hour basis, the Project operational emissions equal about 1,267 pounds of NO_x per day.[46] The significance threshold for operational NO_x emissions in the VCAPCD is 25 lbs/day (Revised DEIR, Table 4.6-16). The Project operational emissions exceed this significance threshold by a factor of 50.6. The significance threshold for operational NO_x emissions in the SCAQMD is 55 lbs/day.[47] The Project operational emissions exceed this significance threshold by a factor of 23.0. The Project operational emissions greatly exceed the significance thresholds established by either the VCAPCD or SCAQMD, and will require mitigation to the maximum extent feasible.

XIII. Project Construction Emissions in Federal Waters Significantly Impact Onshore Air Quality and Must be Mitigated

Re: Section 4.6.4 Impact Analysis and Mitigation

As discussed in Comments III, IV, and X above, all offshore emissions, whether construction or operation, will significantly impact onshore air quality. The Revised DEIR, however, finds that Project construction emissions in Federal waters will cause insignificant air impacts – Class III – with no mitigation required. This finding (Impact AIR-6) is flawed in several key ways.

The Revised DEIR develops this finding of insignificance via an irrelevant and biased emission comparison analysis. In Table 4.6-19 of the Revised DEIR, the offshore construction NO_x emissions are listed as ranging from 2.2 to 2.9 tons per day, or roughly 4,400 to 5,800 pounds of NO_x per day. These daily emissions are compared to emission forecasts for all of the offshore emissions for Ventura County and the South Coast Air Basin (69.1 tons/day), and the emission forecasts for all sources both onshore and offshore for Ventura County and the South Coast Air Basin (831.8 tons/day) (Revised DEIR, p. 4.6-36).

The Revised DEIR concludes: "This comparison suggests that Project construction emissions in Federal waters would represent a moderate fraction of anticipated regional offshore emission but only a small fraction of overall regional emissions" (Revised DEIR, p. 4.6-36). This conclusion is wrong on several levels. The Revised DEIR does not even identify the criteria they are using to determine what constitutes moderate and "only a small fraction." If, on the other hand, the Revised DEIR used the same criteria as it did for Impact AIR-1 (construction emissions within the VCAPCD

[46] 231.3 tons/365 days * 2000 lbs/ton = 1,267 lbs/day.
[47] SCAQMD Air Quality Significance Thresholds, Rev. January 2006.

P373-25 Continued

P373-25 Continued

P373-26

Section 4.6.4 contains a comparison of Project offshore emissions that occur in Ventura County waters to significance criteria outlined in Ventura County Air Quality Assessment Guidelines. No offshore emissions would occur in Los Angeles County waters as a result of the Project. Since the USEPA has proposed to issue an Authority to Construct under Ventura County Air Pollution Control District (VCAPCD) Rule 10, Ventura County significance criteria are not applicable to Cabrillo Port equipment or operations. Emissions from Project vessels (i.e., LNG carriers, tugs, service vessels) operating in Federal waters are not subject to regulation under the Deepwater Port Act, and therefore, the significance criteria or emissions offsets established for Ventura County or Los Angeles County are not applicable.

P373-26

and SCAQMD), the construction emissions in Federal waters would exceed the VCAPCD threshold for significance by a factor of 176 to 232. For the SCAQMD, the construction emissions in Federal waters would exceed the threshold for significance by a factor of 44 to 58. Based on meteorological conditions in the Project area, there is no reason to assume that the same emissions in Federal waters would result in less significant impacts to onshore air quality than would State water emissions.

Also, the comparison of Project emissions to that forecast for the entire regional offshore and onshore areas is inappropriate. Given this criterion virtually no new emission source would be deemed significant, because no new project could possibly be on the scale of the existing air emissions from a region exceeding the area of the South Coast Air Basin. This mass comparison method is never used by the VCAPCD or SCAQMD in determining significance; instead they rely on a simple emission threshold. And even though the construction emissions are anticipated to occur for about 60 days (if all goes according to plan), it is important to remember that the ozone standards are for periods of from one hour (for the CAAQS) to eight hours (for the NAAQS). The daily construction emissions in Federal waters are extremely high when viewed in the same timeframe as these ozone standards. In essence, the emissions that occur during the same averaging periods as the ozone standards are what really matter. It is for this reason that the VCAPCD and SCAQMD construction significance thresholds are only 25 and 100 pounds/day, respectively.

The Revised DEIR also promotes that construction emissions are not expected to occur during May through October, "which is the period of historical high ozone concentrations for the region." (Revised DEIR, p. 4.6-36). This in itself is not mitigation, as there is no guarantee or produced evidence that conditions conducive to high ozone formation will not occur from November through April. Further, scheduling constraints, project delays, and other outside factors (such as marine mammal migrations during winter and early spring) could interfere with the timing of construction activities in Federal waters. Even the Revised DEIR is not entirely certain on this issue, stating that Federal water construction emissions"are not expected to occur during May through October."

Project construction emissions in Federal waters will significantly impact onshore air quality and should be considered and mitigated using the same criteria as construction emissions in State waters. The Revised DEIR has incorrectly identified these emissions as being Class III insignificant impacts.

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XIV. Conclusion

The Revised DEIR is inadequate in identifying, considering, and mitigating air quality impacts; the document must be corrected and recirculated. First, the full scope of Project emissions must be identified in the DEIR, using data, calculations, and analyses that adequately characterize the entire Project liability. And second, rather than assess the Project using significance criteria for several separate and adjacent attainment/nonattainment planning areas, the SLC must evaluate all Project emissions as significantly contributing to the onshore ozone nonattainment problem for Ventura and Los Angeles counties. Accordingly, all operational, construction, marine vessel, and other associated emissions must be evaluated and mitigated with verifiable offsets greater than or equal to the total Project emissions liability. Only then can the Revised DEIR adequately verify that the Project emissions have been mitigated to insignificance.

P373-27

Thank you for the opportunity to comment on the Revised DEIR.

Sincerely,

Camille Sears

Camille Sears

Attachments

P373-27
Your statement is included in the public record and will be taken into account by decision-makers when they consider the proposed Project.